VIA FACSIMILE TRANSMISSION 571-273-8300

Docket No. 135271
PATENT

IN THE SPECIFICATION

Please replace paragraph [0001] with the following paragraph:

[0001] This application is related to Docket No. 137682, Titled "Ultrasound Probe Transceiver Circuitry", filed November 21, 2003, Serial No. 10/719,431, and Docket No. 135274, Titled "Ultrasound Probe Distributed Beamformer", filed November 21, 2003, Serial No. 10/719,417.

Please replace paragraph [0007] with the following paragraph:

[0007] Development of 3D ultrasound has ~~push~~ pushed towards ultrasound probes with a large number of acoustic elements. Recent technology developments suggest reducing the large number of channels by sub-grouping the aperture elements and ~~preprocess~~ preprocessing each group into one signal that is transferred to the system. Transmit can similarly be handled by transmitters solely in the probe, or by transmitting on sub-groups of the aperture.

Please replace paragraph [0008] with the following paragraph:

[0008] High quality images, of course, are of great importance in clinically evaluating the physiology that a doctor is studying. High quality images require use of a non-sparse aperture, e.g. most elements on the aperture must be used both for transmit and receive. Current ~~system~~ systems, achieve this by multiplexing between the transmit and receive circuitry in the system. Each channel in the probe can then be connected with one cable to the system and be used both for transmit and receive.

Please replace paragraph [0043] with the following paragraph:

[0043] In one implementation, the cache memory 133 in the cache memory and controller 112 is organized into ~~of~~ 512k words x 16 bit (8 Mbit) and divided into pages of 128 words. The cache memory pointer can be set to the start of each page. The cache memory pointer may be, for example, a 12 bit pointer that may address a total of 4096 pages. When the cache memory 133 is a 4 Mbit cache, the cache memory pointer may be an 11 bit pointer to index 2048 pages. The words of a cache page are employed when writing or reading data to or from a chain of signal processors 110. The digital data lines for the signal processors 110 on each processing board may be chained through shift registers over a series of plural signal processors 110. Thus, data transferred to the signal processors 110 propagates serially through the signal processors 110. The bit from the word with the lowest address in a page will end in the LSB bit of the shift register to the last signal processor 110 in a chain when loading data. Further, the cache memory 133 is shown within the cache memory and controller 112, but in alternate implementations the cache memory 133 may be separate from the cache memory and controller 112. The cache memory may also be part of the signal processors 110.

Please replace paragraph [0044] with the following paragraph:

[0044] The probe 100 ~~response~~ <u>responds</u> to e.g. sixteen bit commands from the host system 116. One exemplary set of commands is shown below in Table 1. Four bits in the command may be used to define the command, while twelve bits may be used as parameters for the command.

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IN THE CLAIMS

1. (Currently Amended) A sub-aperture transceiver system ~~for~~ to be housed in an ultrasound probe, the system comprising:

a probe housing;

a signal processor located in the probe housing;

receive signal connections coupling the signal processor to a receive aperture comprising acoustic transceiver elements;

transmit signal connections coupled to a transmit aperture comprising at least one acoustic transceiver element multiplexed with the receive aperture;

a receive aperture output driven by the signal processor for carrying a signal obtained over the receive aperture, the receive aperture output being output from the probe housing.

2. (Original) The system of claim 1, where the receive aperture is a triangular aperture.

3. (Original) The system of claim 1, where the transmit aperture is square.

4. (Original) The system of claim 1, where the receive aperture comprises at least two uneven rows of acoustic transceiver elements.

5. (Original) The system of claim 1, where the receive signal connections couple the signal processor to a plurality of receive apertures.

6. (Original) The system of claim 1, where the transmit signal connections couple the signal processor to a plurality of transmit apertures.

7. (Original) The system of claim 6, where the receive apertures are triangular receive apertures.

8. (Original) The system of claim 1, where the signal processor is one of a plurality of signal processors distributed over a plurality of processing boards.

9. (Original) The system of claim 8, where the receive signal connections further couple each signal processor to a plurality of receive apertures.

10. (Currently Amended) A sub-aperture transceiver system comprising:

a first processing board;

a second processing broad joined serially in a chained arrangement with the first processing board; and

receive signal connections for a plurality of receive apertures distributed between the first and second processing boards, the first and second processing boards producing first and second receive data, respectively, the first processing board transferring the first receive data serially to the second processing board that outputs serially the first and second receive data;

where the receive signal connections couple each receive aperture to at least one of the processing boards without partitioning any receive aperture between the processing boards.

11. (Original) The system of claim 10, further comprising:

transmit signal connections for a plurality of transmit apertures distributed between the first and second processing boards,

where the transmit signal connections couple each transmit aperture to at least one of the processing boards without partitioning any transmit aperture between the processing boards.

12. (Original) The system of claim 10, further comprising:

transmit signal connections for a plurality of transmit apertures distributed between the first and second processing boards,

where at least one transmit aperture comprises a transducer element multiplexed between at least on receive aperture.

13. (Original) The system of claim 10, further comprising a first cable bearing selected ones of the receive signal connections to the first processing board and a second cable bearing selected ones of the signal connections to the second processing board.

14. (Original) The system of claim 13, where the first and second cable are flex cables.

15. (Original) The system of claim 13, where the cable comprises selected ones of the receive signal connections for a first transducer array line.

16. (Original) The system of claim 10, further comprising a first signal processor on the first processing board and a second signal processor on the second processing board.

17. (Original) The system of claim 16, where the first signal processor is coupled to a plurality of receive apertures through the receive signal connections and where the second signal processor is coupled to a plurality of receive apertures through the receive signal connections.

18. (Original) The system of claim 10, where the receive apertures are triangular receive apertures.

19. (Original) The system of claim 12, where the transmit apertures are square transmit apertures.

20. (Original) The system of claim 10, where the first and second processing boards are disposed in an ultrasound probe.

21. (Currently Amended) A method in an ultrasound system for sub-aperture processing, the method comprising the steps of:

receiving, at a signal processor located in an ultrasound probe, a plurality of receive signals from acoustic transducer elements that comprise a receive aperture;

multiplexing, within the ultrasound probe, at least one of the acoustic transducer elements between the receive aperture and a transmit aperture; and

driving a receive aperture output coupled to the signal processor with a signal obtained over the acoustic transducer elements in the receive aperture.

22. (Original) The method of claim 21, where the receive aperture is a triangular aperture.

23. (Original) The method of claim 21, where the transmit aperture is square.

24. (Currently Amended) The method of claim 21, where the step of receiving comprises the step of:

receiving, for a plurality of receive apertures, receive signals distributed to a first signal processor on a first a first processing board and a second signal processor on a second processing ~~broad~~ board without partitioning any receive aperture between the processing boards.

25. (Original) The method of claim 21, further comprising the step of:

coupling transmit signals to a plurality of transmit apertures over transmit signal connections distributed between the first and second processing boards,

where the transmit signal connections couple each transmit aperture to at least one of the processing boards without partitioning any transmit aperture between the processing boards.